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15 September 2016

Melville P. Coté, Jr.
Chief, Surface Water Branch
U.S. Environmental Protection Agency, Region 1
Five Post Office Square, Suite 100
Boston, MA 02109

Dear Mr. Cote:

As requested, please find the enclosed updated dredging and disposal capacity needs for Eastern Long Island Sound. To summarize our estimates, the total capacity need with all potential sources considered, including future improvement work and storm events over the next 30 years is approximately 20.2 million CY.

This estimate provides additional detail not presented in the more general discussion in the Long Island Sound Dredged Material Management Plan to identify the sources and capacity needed for dredged material placement in the eastern Sound over the next 30 years. This analysis includes estimates for potential future navigation improvements, contingencies to address the fiscal ability of the states to partner in beneficial use projects, and to address the likelihood of emergency dredging needed due to future storm events.

As stated in our comments submitted on July 15 on the Eastern Long Island Sound SEIS, and as described in the introductory portion of our more detailed analysis, we continue to believe that designation of multiple sites is necessary to address both the open water placement needs and project costs for the many Federal and non-Federal dredging projects in the region. Capacity needs and cost are both critical considerations in the number, size and siting of open water placement sites for the eastern Sound.

If you have any questions or comments, please contact Mr. Mark Habel at 978-318-8871 or mark.l.habel@usace.army.mil.

Sincerely,

A handwritten signature in dark ink, appearing to read "Mark Habel", is written over a horizontal line.

FOR Chief, Civil/IIS Project Management Branch

Eastern Long Island Sound Dredging and Disposal Capacity Needs

The Eastern Long Island Sound Supplemental Environmental Impact Statement (ELIS SEIS) investigated a number of alternative open water placement sites in the eastern Sound and adjacent waters, of which three were carried forward after screening for consideration in the public review draft. These three sites were, from east to west:

- Eastern Long Island Sound (ELDS) – Essentially an expanded New London Disposal Site, located more westerly to avoid areas of the existing site that had reached their practical capacity, and to move the site farther from Fisher’s Island, NY. After the public review was completed the eastern site boundary was moved further west to avoid the shipping approach lane to New London Harbor. Several configurations are under consideration by EPA for this site with capacities that range from 16 million cubic yards (MCY) to 27 MCY.
- Niantic Bay Disposal Site (NBDS) – Last used for Federal Navigation Project disposal is 1970, this site is located just outside Niantic Bay southwest of Bartlett Reef and south-southeast of Black Point. In the ELIS SEIS the site is expanded to the northeast. The northern portion of the expanded site is depositional, while the southern portion is dispersive. The depositional area has a capacity of about 14 MCY.
- Cornfield Shoals Disposal Site (CSDS) – This frequently used site is located in the deep mid-Sound area south of the mouth of the Connecticut River. The site is dispersive and is used for sand or clean sandy silty materials from the Connecticut River channels and other small area harbors. Due to its dispersive nature the site has an indefinite capacity and useable life.

EPA has expressed an intent to forgo designation and further use of the CSDS due to its dispersive nature. This is despite the fact that there is no evidence that the use of the CSDS for clean sands and other clean sediments has had any significant impact on the environment and resources of LIS. The consequence of this action would be to place more material at the site or sites that do get designated for the eastern Sound and allocating the site(s) capacity to material that could otherwise be placed in a dispersive environment. The distance between the CSDS and the new ELDS is about 14 miles. Elimination of the CSDS from the placement options available for dredging projects would increase costs for eastern LIS harbors that would then need to use either the Central LIS site (CLDS) or whichever sites were designated further east.

Reliance on a single designated site for eastern LIS carries significant cost impacts and risks. As the calculations in this analysis show, without the CSDS available for cleaner and sandier materials from the more westerly harbors in the eastern Sound, neither the depositional area of the NBDS or EPA’s reduced westerly configuration of the ELDS will accommodate the projected 20.2 MCY need for the eastern Sound’s harbors. A combination of open water sites will therefore be necessary to meet the region’s needs for dredged material placement. Since a significant portion of this need is for depositional capacity, then a combination of ELDS with either NBDS or CSDS is needed.

Cost will always be a factor in determining placement site practicability. Longer haul distances mean greater construction times, more fuel burned, and for larger projects additional equipment required to ensure completion within available work windows and environmental time of year restrictions. The distance from the proposed ELDS to with NBDS, CSDS or CLDS is 4, 14 and 42 miles, respectively. Depending on the site and size of the project such differences could add tens of thousands to tens of millions of dollars in cost.

Dredging Needs and Site Capacity Calculations

The original calculations for 22.6 million cubic yards for Eastern Long Island Sound. This included 13.5 million CY of suitable fines and 9.1 million CY of clean sand. This calculation included all dredging sources east of the Mattituck Sill, a low ledge area that crosses the sound from south-southeast at Mattituck north-northwest to Guilford and forms the boundary between eastern and central LIS. If the existing Cornfield Shoals Disposal Site is eliminated from consideration in the final rule, then Guilford Harbor is now closer to CDLS than it would be to an ELDS. Discounting Guilford Harbor and areas of Rhode Island located east of Little Narragansett Bay yields the following revised numbers.

Dredging Center	Suitable Fine	Suitable Sand	Unsuitable	Total CY
Fisher's Island NY	65,200	0	0	65,200
Fisher's Island Sound and Little Narragansett Bay RI & CT	1,553,500	77,300	0	1,630,800
New London CT	5,853,500	0	80,900	5,934,400
Niantic CT	377,700	122,700	0	500,400
Connecticut River CT	2,535,100	3,284,600	0	5,819,700
Clinton-Westbrook CT	897,800	2,144,400	0	3,042,200
Suffolk County Northeast Shore	0	174,600	0	174,600
Great & Little Peconic Bays NY	862,100	1,273,200	0	2,135,300
Shelter Is. - Gardiners Bay NY	337,900	1,374,900	0	1,712,800
Montauk NY	0	609,800	0	609,800
TOTAL ALL DREDGING	12,482,800	9,061,500	80,900	21,625,200
NEW YORK	1,265,200	3,432,500	0	4,697,700
CT & RI	11,217,600	5,629,000	80,900	16,927,500

Total dredging in the eastern LIS area over the next 30 years is estimated at 21,625,200 CY. All unsuitable material will not go into the open water, but instead will require containment or treatment. Discounting that unsuitable material reduces the total demand to 21,544,300 CY (12.5 MCY fines and 9.1 MCY sands). These numbers only include one Federal Navigation

Project improvement; the upstream extension and deepening of the channel at Mystic Harbor, CT, estimated at 450,000 CY.

To determine what portion of this total estimated demand reasonably could be expected to require open water placement capacity, some adjustments can be made. Sandy materials are valuable for beach nourishment, nearshore bar placement, and other coastal resiliency applications. In New York nearly all sandy materials are beneficially used for these purposes or occasionally placed upland. Recently Connecticut has been funding sandy material beneficial use for nourishment using funds made available through a state bond. In the future it is likely that these uses will become increasingly relied on, however not all sandy material is likely to be beneficially used. For small-scale projects by marinas and boat yards the additional expense may prove impractical. Not all Federal actions can be expected to find cost-sharing sponsors for beneficial uses. So some portion of sandy material would likely still require open water placement.

Connecticut and Rhode Island totals for material sources and types break down as shown in the table below. A total of 11,217,600 CY fine material and 5,629,000 CY of sandy material need dredging in the eastern Sound. Of the sand, 827,400 CY is from small non-Federal permit actions, and 4,801,600 CY are from USACE FNP. In the LIS DMMP, Base Plans for FNP for the eastern LIS show that about six percent of sand from FNP (290,500 CY) will require open water placement, with the remainder placed on beaches, nearshore bars, or in the case of the middle and upper Connecticut River channels, at in-river placement sites.

This number carries significant risk as it assumes the state bond authority will continue to be funded for beneficial use and cost-sharing purposes, and that once exhausted the bond limit will be either extended or new bond authority authorized by the state legislature and/or the new Connecticut Port Authority. This assumption risks significantly under-estimating the future placement of sandy material in open water given the State's current fiscal situation. Even where beach nourishment is the Federal base plan state or local interests must provide real estate interests, perpetual public access rights and facilities and other items of cooperation. Of the 2,221,700 CY of FNP sandy material to be dredged with nourishment (beach or bar) as the base plan, if even one quarter could not be used for nourishment due to non-Federal fiscal constraints, then an additional 555,000 would need to consider open water placement.

For non-Federal permit actions generating sandy material in the eastern Sound, most are small-scale marina operations that dredge only a few hundred to a few thousand CY at a time. For these users mechanical dredging is the most economical method, and where their volumes do not exceed 25,000 CY MPRSA does not apply. If say one-third of all permit action sandy material would still require open water placement due to lack of private funding for more expensive placement options, then about 275,800 CY from these sources would still require open water placement sites.

The total Eastern Long Island Sound open water placement capacity needed in the total of all fine grained suitable material (11,217,600 CY), plus the Federal sand material for which the base plan in open water (290,500 CY), plus the contingency volume for sandy material to account for potential non-Federal fiscal limitations (555,400), plus a portion of the sandy material from smaller private permit dredging projects (275,800). This yields a total of about 12,339,300 CY from Connecticut.

Connecticut Dredging Centers – Source and Material Type Details								
Dredging Center	USACE FNPs		Other Federal		Non-Federal		Totals	
	Sand	Fines	Sand	Fines	Sand	Fines	Sand	Fines
FIS & LNB	77,300	822,700	0	0	0	730,800	77,300	1,553,500
New London	0	4,519,800	0	539,000	0	794,700	0	5,853,500
Niantic CT	9,500	8,500	0	0	113,200	369,200	122,700	377,700
Conn. River	2,570,400	1,820,900	0	0	714,200	714,200	3,284,600	2,535,100
Clinton-Westbrook	2,144,400	88,500	0	0	0	809,300	2,144,400	897,800
TOTAL	4,801,600	7,260,400	0	539,000	827,400	3,418,200	5,629,000	11,217,600
Federal Base Plans - Sand					One-Third Sand Volume			
Beach	273,700				275,800			
Nearshore	1,948,000							
Open Water	290,500							
In-River	2,289,400							
Contingency	555,400							

For New York, the distribution of dredged material by dredging center, source of dredging and material type is shown in the table below. These harbors will generate an estimated total of 1,265,200 CY of silty material and 3,432,500 CY of sand. All of the sand from FNP maintenance has a DMMP base plan of beach nourishment and would not require open water placement capacity. Similarly, other non-Corps Federal dredging actions generating sand also have beach nourishment as a base plan. Non-Federal permit actions, which are estimated to generate 3,102,900 CY would also likely be placed on area beaches, upland or nearshore, given their distance from the open water sites in Long Island Sound. For NY projects then only the 1,265,200 CY of fine-grained material would benefit from open water placement options.

New York Dredging Centers – Source and Material Type Details								
Dredging Center	USACE FNP		Other Federal		Non-Federal		Totals	
	Sand	Fines	Sand	Fines	Sand	Fines	Sand	Fines
Fishers Is.	0	12,000	0	0	0	53,200	0	65,200
Northeast Suffolk C.	113,200	0	0	0	61,400	0	174,600	0
Peconic Bays	0	13,300	0	0	1,273,200	848,800	1,273,200	862,100
Shelter Is. Gardiners Bay	3,200	0	20,000	0	1,351,700	337,900	1,374,900	337,900
Montauk	193,200	0	0	0	416,600	0	609,800	0
TOTAL	309,600	25,300	20,000	0	3,102,900	1,239,900	3,432,500	1,265,200
Federal Base Plans - Sand								
Beach	309,600		20,000					

Federal Improvement Dredging Projects

Improvement dredging was not included in the DMMP projections for FNP unless an outstanding study request was currently active. Only two improvement project proposals were open at the time. The New Haven Harbor port deepening study is now underway, however this harbor is not in the eastern LIS area. The Mystic Harbor CT upper river channel extension and anchorage deepening study has not yet commenced, as local interests were forced to spend significant sums in 2015/2016 to haul their dredged material to the CLDS instead of the nearby and less costly New London site. Feasibility cost-sharing is not likely near term, but this proposal is likely to be revived during the 30-year DMMP planning horizon.

Like any complex system, the nation's and region's marine transportation system requires both maintenance and improvement to keep pace with the needs of commerce and safe navigation. Typically each New England state has one to three Section 107 small harbor navigation improvements studied and constructed each decade. These are a mix of modifications to existing small harbor FNP, such as channel deepening and anchorage expansion projects, and development of new FNP at harbors that have not been dredged by the USACE before. Typically these projects generate 50,000 to 250,000 CY. If say four such projects were built in Connecticut during the next 30 years then about 600,000 CY of material could be expected to be dredged. With half of CT's shoreline on the eastern Sound, 300,000 CY of that would be expected in that area.

Larger improvement dredging projects are also periodically studied and constructed in each region of New England. These range from roughly 500,000 CY up to 10 million CY or more. If

one project in that range not currently under study or subject of a pending study authority were to be pursued in the next 30 years, such as deepening the waterfront channels of New London, deepening the main stem channels of the Connecticut River up to Middletown, or relocating the entrance channel into Little Narragansett Bay, each of which has been suggested in the past, a significant additional volume of dredged material could be generated in the eastern Sound. It is not possible to predict what portion of such a project might be sandy versus fine grained materials. Though most improvement projects in New England involve the removal of mixed glacial tills and marine clays. For purposes of this estimate a volume of one quarter of that range, or 2,500,000 CY has been used.

Response to Large Storm Events

Superstorm Sandy, Hurricane Irene, and many large storms before that have all resulted in a critical need for advanced maintenance dredging of the region's ports and waterways. In Long Island Sound this work has been accomplished through the use of both Government-owned dredging equipment and contracts issued to both large and smaller-scale dredging companies. In the aftermath of Superstorm Sandy maintenance was accelerated at five Connecticut harbors and contract volumes were increased at three others to account for additional shoaling. Between late 2012 and early 2014 about 1.4 million CY was dredged from Connecticut harbors, of which about 150,000 CY was placed on beaches or nearshore bars as nourishment material. While probably half of that 1.4 million CY total was not due to the storm, the additional shoaling required a rapid response with cost as a critical factor to ensure the maximum application of available funds to the problem. Removal of shoal material from New Haven Harbor due to Hurricane Sandy occurred concurrent with that project's typical ten-year maintenance cycle. Had the storm occurred a few years before or after when it did, a separate maintenance operation would have been required at New Haven to remove additional shoal in the amount of several hundred thousand CY.

While it is unknown when the next superstorm or large hurricane will impact Long Island Sound it is likely that one or more such storms will strike the region over the 30-year DMMP planning horizon, creating a need to respond quickly and cost-effectively. Based on historical records, two such storms could be expected in that period. The use of dredged materials beneficially in coastal resiliency projects may reduce the long-term cost of such responses, it can never eliminate that need. For the purposes of this estimate a volume equal to half the amount dredged in the aftermath of Sandy (700,000 CY) minus an estimated 200,000 CY of potential sand material, and with a contingency equal to about half the 800,000 CY typically removed from New Haven every ten years will be used. These volumes total about 900,000 CY per event, or a total of 1,800,000 CY for emergency response and accelerated maintenance for two major storm events over the next 30 years.

Management of Unsuitable Materials with CAD Cells

Construction of Confined Aquatic Disposal Cells for the containment of unsuitable dredged materials has proven to be an economical method for isolating such materials from the environment while allowing harbor dredging projects to proceed. Typically CAD cell construction involves digging a pit beneath the bottom of a harbor of sufficient depth and capacity to accommodate a bulked-up volume of the material to be placed in the cell, with vertical room to accommodate a cap of clean material over the filled cell and not interfere with navigation or risk re-exposure of the capped material by erosion. In eastern Long Island Sound only New London Harbor is expected to yield unsuitable dredged materials, with a total of 80,900 CY generated by USACE and other Federal projects. A CAD cell or cells sufficient to accommodate that unsuitable volume would require about 120,000 of parent material excavation, material that would likely be suitable for open water placement and not suitable for nourishment purposes. Typically when the USACE constructs CAD cells state and municipal agencies pay for additional capacity to accommodate their own needs and those of local marinas that have few other cost-effective options for dealing with unsuitable materials. This increases the amount of material dredged to form the cell's capacity. For this estimate it is assumed that the cell construction volume would increase by one-third for this purpose for a total of 160,000 CY.

Summary

The volume of material estimated to be generated in eastern Long Island Sound dredging centers that is likely to require open water placement over the 30-year DMMP planning horizon fine-grained material from Federal Navigation Projects and permit activities in Connecticut, Rhode Island (Little Narragansett Bay), and New York, minor portions of the sandy material generated by FNPs and other dredgers in Connecticut, and improvement projects not identified in the DMMP which could be expected to be studied and constructed in that timeframe. The amounts generated are shown in the table below and total an estimated 18.4 million CY.

It should also be noted that dredged material volumes for Federal projects are measured in-place before construction and as the difference between pre-construction and after-dredge surveys for purposes of payment and reporting on volume disposed. During the dredging process bulking occurs as the dredged material is mixed with water in the scow and during its disposal. While material placed at an open water site will re-consolidate over time, in terms of estimating required site capacity some bulking factor should be applied.

Appropriate bulking factors depend largely on the physical nature of the material being dredged and disposal. Less consolidated materials like silts will have high bulking factors of 20 to 30 percent, while more consolidated materials like marine clays and compacted glacial tills will have factors of 5 to 10 percent. For the purpose of this estimate a factor of 10 percent was used to account for the range of materials and the re-consolidation of materials

at the disposal site over time. With bulking considered, the capacity required for open water placement in eastern LIS is estimated at about 20.2 million CY.

Eastern Long Island Sound Open Water Capacity Need	
Source of Dredged Material	Cubic Yards
Fine-Grained Material from Eastern CT Dredging Centers	11,217,600
CT FNP's Open-Water Base Plan Sandy Material	290,500
CT Permit Actions 1/3 Sand	275,800
CT FNP Sandy Material Fiscal Contingency	555,400
Fine-Grained Material from Eastern NY Dredging Centers	1,265,200
Small-Scale FNP Improvements Not in DMMP	300,000
Deep Draft FNP Improvements Not in DMMP	2,500,000
Emergency Response and Accelerated O&M	1,800,000
CAD Cell Construction	160,000
TOTAL ELIS Open Water	18,364,500
With 10% Bulking Factor	20,201,000
SAY	20,200,000

